APPENDIX 8.1H

# Cumulative Impacts Analysis Protocol

Potential cumulative air quality impacts that might be expected to occur resulting from Eastshore and other reasonably foreseeable projects are both regional and localized in nature. These cumulative impacts will be evaluated as follows.

## Regional Impacts

Regional air quality impacts are possible for pollutants such as ozone, which involve photochemical processes that can take hours to occur. Eastshore will provide emissions offsets (mitigation) for $NO_x$ and POC at the ratios specified in the BAAQMD regulations. Additional CEQA-related mitigation for other pollutants will likely be required by the CEC.

Although the relative importance of POC and $NO_x$ emissions in ozone formation differs from region to region, and from day to day, most air pollution control plans in California require roughly equivalent controls (on a ton per year basis) for these two pollutants. The change in emissions of the sum of these pollutants, equally weighted, will be used to provide a reasonable estimate of the impact of Eastshore on ozone levels. The net change in emissions of ozone precursors from Eastshore will be compared with emissions from all sources within Alameda County (Table 8.1H-1), and within the Bay Area Air Basin (Table 8.1H-2) as a whole.

**TABLE 8.1H-1**
Alameda County Emissions Inventory Data for 2004 (average tons/day)

| Source Category | TOG | ROG | CO | $NO_x$ | $SO_x$ | PM10 | PM2.5 |
|---|---|---|---|---|---|---|---|
| Total Stationary Sources | 110.2 | 18.8 | 3.1 | 6.3 | 1.5 | 3.3 | 2.1 |
| Total Area Sources | 30.2 | 18.9 | 33.5 | 3.9 | 0.1 | 27.5 | 8.9 |
| Total Mobile Sources | 51.6 | 47.3 | 423.4 | 100.8 | 2.5 | 4.3 | 3.5 |
| Total Natural Sources | 12.2 | 11.4 | 2.1 | 0.1 | 0.0 | 0.2 | 0.2 |
| County Total | 204.2 | 96.4 | 462.1 | 111.1 | 4.1 | 35.3 | 14.7 |

Source: CARB

Table 8.1H-2 presents data on the estimated San Francisco Air Basin Emissions Inventory for 2004.

**TABLE 8.1H-2**
Air Basin Emissions Inventory Data for 2004 (average tons/day)

| Source Category | TOG | ROG | CO | NOx | SOx | PM10 | PM2.5 |
|---|---|---|---|---|---|---|---|
| Total Stationary Sources | 517.6 | 89.4 | 42.3 | 68.3 | 58.6 | 16.0 | 12.3 |
| Total Area Sources | 160.8 | 90.1 | 175.4 | 19.3 | 0.6 | 151.6 | 48.6 |
| Total Mobile Sources | 255.3 | 233.4 | 2104.6 | 472.3 | 12.4 | 21.3 | 17.1 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Total Natural Sources | 116.1 | 106.5 | 49.4 | 1.6 | 0.5 | 5.1 | 4.3 |
| Basin Total | 1049.8 | 519.4 | 2371.7 | 561.5 | 72.1 | 194.0 | 82.3 |

Source: CARB

Air quality impacts related to fine particulate, or PM10/2.5, emissions have the potential to be either regional or localized in nature. On a regional basis, an analysis similar to that presented above for ozone will be performed, looking at the three pollutants that can form PM10/2.5 in the atmosphere, i.e., POC, $SO_x$, and $NO_x$, as well as directly emitted particulate matter.

As in the case of ozone precursors, emissions of PM10/2.5 precursors are expected to have an approximately equivalent ambient impact with respect to their influence on PM10 formation per ton of precursor emissions on a regional basis. Table 8.1H-3 provides the comparison of emissions of the criteria pollutants from Eastshore with emissions from all sources within Alameda County, and within the Bay Air Basin as a whole. Emissions are based on the worst-case daily emissions as presented in Appendix 8.1A.

**TABLE 8.1H-3**
Facility Emissions Comparison to County and Air Basin Inventories (average tons/day)

| Source Category | TOG[1] | ROG | CO | $NO_x$ | $SO_x$ | PM10 | PM2.5 |
|---|---|---|---|---|---|---|---|
| Air Basin Total | 1049.8 | 519.4 | 2371.7 | 561.5 | 72.1 | 194.0 | 82.3 |
| County Total | 204.2 | 96.4 | 462.1 | 111.1 | 4.1 | 35.3 | 14.7 |
| Lean Burn Emissions[2,3] | - | 0.47 | 0.52 | 0.34 | 0.04 | 0.42 | 0.42 |
| Black Start Diesel Engine Emissions[2,4] | - | 3.66E-05 | 1.06E-04 | 8.95E-04 | 1.92E-06 | 5.29E-05 | 5.29E-05 |
| Facility Emissions[5] | - | 0.47 | 0.52 | 0.34 | 0.04 | 0.42 | 0.42 |
| Facility Emissions % of County | - | 0.49% | 0.11% | 0.31% | 0.94% | 1.20% | 2.88% |
| Facility Emissions % of Air Basin | - | 0.09% | 0.02% | 0.06% | 0.05% | 0.22% | 0.52% |

[1] Eastshore POC emissions compared to inventory ROG emissions.
[2] Assumes that all PM10 emissions are PM2.5 for conservative estimate.
[3] Daily emissions represent the total annual emissions of all 14 engines (Appendix 8.1A, Table 8.1A-8) at 24 hours per day operation, or a calculated 166.7 days per year.
[4] Daily emissions represent the total annual emissions of the black start diesel engine (Appendix 8.1A, Table 8.1A-9) at 1 hour per day operation or a calculated 30 days per year.
[5] Facility emissions include the 14 lean burn gen sets and the black start diesel engine.

## Localized Impacts

Localized impacts from Eastshore operation could result due to emissions of carbon monoxide, oxides of nitrogen, sulfur oxides, and/or directly emitted PM10. A dispersion modeling analysis of potential cumulative air quality impacts will be performed for all four of these pollutants.

In evaluating the potential cumulative localized impacts of Eastshore operations in conjunction with the impacts of existing facilities and facilities not yet in operation but that are reasonably foreseeable, a potential impact area in which cumulative localized impacts could occur was identified by CEC staff as an area within a radius of 8 miles around the plant site. Based on the results of the air quality modeling analyses described in AFC Section 8.1 (Air Quality), "significant" air quality impacts, as that term is defined in federal air quality modeling guidelines, have not been determined for the Eastshore project. If the project's impacts do not exceed the significance levels, no cumulative impacts would be expected to occur, and no further analysis would be required. Should data be developed which shows that the Eastshore project emissions would result in "significant" impacts, then all projects identified within a search area with a radius of 8 miles beyond the project's impact area will be used for the cumulative impacts analysis. Within this search area, three categories of projects or sources will be evaluated for inclusion in the analysis:

- Projects that are existing and have been in operation prior to January 1, 2006 (emissions are included in the overall background air quality assessment).
- Projects for which air pollution permits to construct have been issued and that began operation after January 1, 2006.
- Projects for which air pollution permits to construct have been issued after January 1, 2006, but that are not yet in operation.

Projects that are existing and have been in operation prior to January 1, 2006 will be reflected in the ambient air quality data that has been used to represent background concentrations; consequently, no further analysis of the emissions from this category of facilities will be performed. The cumulative impacts analysis adds the modeled impacts of selected facilities to the maximum measured background air quality levels, thus ensuring that these existing projects are taken into account. All other projects will be identified by a request to the BAAQMD for an applicable source or facility listing.

The Eastshore project is not expected to trigger PSD review. Notwithstanding the foregoing, a list of sources within the project region meeting the above noted criteria has been requested from the BAAQMD staff.

Given the potentially wide geographic area over which the dispersion modeling analysis may be performed, the ISCST3 model will be used to evaluate cumulative localized air quality impacts. The detailed modeling procedures, ISCST3 options, and meteorological data used in the cumulative impacts dispersion analysis will be the same as those described in the AFC Air Quality section. The receptor grid spacing will be determined in consultation with the BAAQMD for the area in which the detailed modeling analysis is to be performed.

## Cumulative Impacts Dispersion Modeling

The dispersion modeling analysis of cumulative localized air quality impacts for the proposed project will be evaluated in combination with other reasonably foreseeable projects and air quality levels attributable to existing emission sources, and the impacts will be compared to state or federal air quality standards for significant impact. As discussed above, the highest second-highest modeled concentrations will be used to

demonstrate compliance with standards based on short-term averaging periods (24 hours or less).

Supporting information used in the analysis will include the following:

- 2004 estimated emissions inventory for Alameda County (Table 8.1H-1) and for the Bay Area Air Basin (Table 8.1H-2);
- List of projects and their respective coordinate locations resulting from the screening analysis of permit files of the BAAQMD;
- Stack parameters for sources included in the cumulative air quality impacts dispersion modeling analysis; and
- Input/Output files for the dispersion modeling analysis.